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10/089,156

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Hiroaki Munehira

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04/27/2009

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EXAMINER

WANG, QUAN ZHEN

ART UNIT

PAPER NUMBER

2613

NOTIFICATION DATE

DELIVERY MODE

04/27/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/089,156 | Applicant(s) MUNEHIRA ET AL. | |
| | Examiner QUAN-ZHEN WANG | Art Unit 2613 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kerfoot et al. (U.S. Patent US 6,704,511 B1) in view of Ryu et al. (U.S. Patent US 6,330,384B1) and Cao (U.S. Patent US 6,731,877 B1), and further in view of Hamada (U.S. Patent US 5,703,711).

Regarding claims 15 and 17, and claim 19, Kerfoot discloses a wavelength division multiplexing and optical transmission apparatus (fig. 3), comprising:

an optical multiplexer (fig. 3, multiplexer 132) configured to transmit a multiplexed optical signal including a non-modulated spectrum slice optical signal (fig. 3, signals from dummy optical source 200) and a plurality of modulated optical signals (fig. 3, signals from transmitters 150);

a plurality of optical transmitting units (fig. 3, transmitters 150) configured to output the plurality of modulated optical signals to respective input ports of the optical multiplexer, each of the optical transmitting units configured to modulate a unique wavelength with a plurality of data signals and to output a respective modulated optical signal occupying a respective portion of a signal band; and

a dummy optical signal source device (fig. 3, dummy optical source 200) configured to generate the non-modulated spectrum slice optical signal, including:

an input optical amplifier with non input (column 3, lines 53-56) to generate an amplified spontaneous emission light signal,

a light dividing element (fig. 5, DEMUX 144) connected the output of the optical amplifier device and configured to output plural signals related to the amplified spontaneous emission light signal,

at least a first and second plurality of bandpass filters (fig. 5, the bandpass filters) having adjacent filter pass bands, each bandpass filter having a respective bandpass characteristic (inherent) and each arranged to receive a respective one of the plural signals output from the light dividing element and configured to output respective non- modulated spectrum slice optical signal components (fig. 7, signals 182 and 184), a first non-modulated spectrum slice optical signal component being adjacent on a high side to the signal band, a second non-modulated spectrum slice optical signal component being adjacent on a low side to the signal band (fig. 7),

at least a first dummy signal optical multiplexer (fig. 5, MUX 146), each dummy signal optical multiplexer having inputs connected to outputs of the plurality of bandpass filters, respectively (fig. 7).

Kerfoot differs from the claimed invention in that Kerfoot does not specifically disclose that the dummy optical source comprising a second dummy signal multiplexer. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a second dummy signal multiplexer in the system of Kerfoot, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

The modified system of Kerfoot differs from the claimed invention in that Kerfoot does not specifically disclose that the input optical amplifier having a signal input terminated without reflection. However, it is well known in the art to terminate an optical amplifier without reflection for a broad band amplified spontaneous emission light source. For example, Ryu teaches an optical amplifying means (fig. 3) for outputting an amplified spontaneous emission light signal including an optical amplifier having a signal input terminated without reflection (fig. 3, terminal end 50). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to use the termination concept of Ryu in the system of Kerfoot to configure the optical amplifying means including an optical amplifier having a signal input terminated without reflection. One of ordinary skill would be motivated to do so in order to avoid an undesired oscillation (Ryu, column 3, lines 18-24).

The modified system of Kerfoot and Ryu differs from the claimed invention in that Kerfoot and Ryu do not specifically disclose that the dummy optical signal source comprising: at least a first and second output optical amplifier, each having an input

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connected to an output of a respective one of the dummy signal optical multiplexer, and having respective outputs. However, Cao, from the same field of endeavor, teaches a concept of connecting an optical amplifier (i.e., fig. 4, amplifier 9) to a multiplexer (fig. 1, Amplifiers 24a and 24b). It is well recognized that an optical signal degrades as it travels through a transmission line or an optical component, and it is also well recognized that an optical amplifier could be used at any point of a communication system to restore signal strength of an optical signal, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate optical amplifiers connecting to the first and second signal multiplexer in the modified system of Kerfoot and Ryu, as it is disclosed by Cao, in order to restore or boost the optical signal strength to a desired level.

The modified system of Kerfoot, Ryu, and Cao differs from the claimed invention in that Kerfoot, Ryu, and Cao do not specifically disclose that the optical amplifiers are configured to modify a gain of at least one non-modulated spectrum slice optical signal component in order to maintain a predetermined overall gain profile of the non-modulated spectrum slice optical signal components when no signal is available for amplification for one of the non-modulated spectrum slice optical signal components. However, using a controller to control an optical amplifier to set a gain to a predetermined profile is well known in the art. For example, Hamada discloses utilizing a controller to control an optical amplifier to modify the gain to a predetermined gain profile (abstract, column 2, lines 13-32, and figs. 1-6). In addition, any one of ordinary skill in the art would understand that an optical amplifier in the art is transparent to

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signals carried by optical carriers. In other words, an optical amplifier amplifies the input light within the amplification spectral band to the amplifier regardless if there is signal (data) carried by the light or not. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a controller of Hamada into the modified system of Kerfoot, Ryu, and Cao to amplify the non-modulated spectrum slice optical signal components. One of ordinary skill in the art would have been motivated to do so in order to provide a gain according to predetermined value (Hamada: abstract).

Regarding claims 16 and 18, the modified system of Kerfoot, Ryu, and Cao differs from the claimed invention in that Kerfoot, Ryu, and Cao do not disclose that the dummy optical signal source device in the system further comprising:

- a third, fourth and fifth plurality of bandpass filters having adjacent filter pass bands, and arrange to receive respective ones of the plural signals output from the light dividing element,

- a third, fourth and fifth dummy signal optical multiplexer connected to a respective one of the third, fourth and fifth plurality of bandpass filters,

- a third, fourth and fifth output optical amplifier connected to a respective one of the third, fourth and fifth dummy signal optical multiplexer, the third and fifth output optical amplifier configured to amplify at a heightened amplification level when the fourth output optical amplifier does not output a corresponding non-modulated spectrum slice optical signal so as to maintain a predetermined overall gain profile of the non-

modulated spectrum slice optical signals input to the dummy signal optical multiplexer.

However, these limitations are further duplications of the essential working parts of the modified system of Kerfoot, Ryu, and Cao. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to configure the dummy optical signal source device in the system further including:

a third, fourth and fifth plurality of bandpass filters having adjacent filter pass bands, and arrange to receive respective ones of the plural signals output from the light dividing element,

a third, fourth and fifth dummy signal optical multiplexer connected to a respective one of the third, fourth and fifth plurality of bandpass filters,

a third, fourth and fifth output optical amplifier connected to a respective one of the third, fourth and fifth dummy signal optical multiplexer, the third and fifth output optical amplifier configured to amplify at a heightened amplification level when the fourth output optical amplifier does not output a corresponding non-modulated spectrum slice optical signal so as to maintain a predetermined overall gain profile of the non-modulated spectrum slice optical signals input to the dummy signal optical multiplexer;

since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Response to Arguments

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3. Applicant's arguments with respect to claim rejections under 35 U.S.C. 112 are moot in view of the cancellation of the rejections.

4. Applicant's other arguments filed on 3/24/2009 have been fully considered but are not persuasive.

Applicant argues, "... Hamada does not specifically describe modifying a gain of at least one non-modulated spectrum slice optical signal component in order to maintain a predetermined overall gain profile of the non-modulated spectrum slice optical signal components when no signal is available for amplification for one of the non-modulated spectrum slice optical signal components." However, any one of ordinary skill in the art would understand that an optical amplifier in the art is transparent to signals carried by optical carriers. In other words, an optical amplifier amplifies the input light within the amplification spectral band to the amplifier regardless if there is signal (data) carried by the light or not.

Applicant argues, "Although Hamada describes an optical amplifier that can amplify a signal, Hamada never goes into detail regarding what triggers this amplification (e.g. in the claimed invention the amplification is triggered when no signal is available for amplification for one of the non-modulated spectrum slice optical signal components)". However, the argued terminology is not reflected in the claim. For example, the claim does not cite the "detail regarding what triggers" the amplifier.

Applicant further argues that Hamada does not describe that "this amplification modifies a gain of at least one non-modulated spectrum slice optical signal component

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in order to maintain a predetermined overall gain profile of the non-modulated spectrum slice optical signal components.” However, as it is indicated in the rejection, an optical amplifier in the art is transparent to signals carried by optical carriers. In other words, an optical amplifier amplifies the input light within the amplification spectral band to the amplifier regardless if there is signal (data) carried by the light or not. As to the predetermined overall gain profile, it is an inherent feature of the amplifier of Hamada.

For the above reasons, the rejections of claims 15-19 still stand.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to QUAN-ZHEN WANG whose telephone number is (571)

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272-3114. The examiner can normally be reached on 9:00 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

4/20/2009

/Quan-Zhen Wang/

Primary Examiner, Art Unit 2613